DOCUMENT RESUME

ED 198 550 CS 206 131

AUTHOR Dobrin, David N.
TITLE What's Difficult about Teaching Technical Writing.
PUB DATE 80
NOTE 11p.; Paper presented at the Annual Meeting of the Modern Language Association of American (95th, Houston, TX, December 27-30, 1980).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Curriculum Problems; Higher Education; Teacher Background; *Technical Writing; Writing (Composition); *Writing Instruction
IDENTIFIERS *Writing Evaluation

ABSTRACT

A teacher is likely to encounter three kinds of difficulty with technical writing instruction. The first is transitory difficulty, which a teacher may reasonably expect to overcome with practice. This is the difficulty a teacher may have in learning a new curriculum or the needs of a new group of students, in making up and grading assignments, and in gaining a feel for the technical style. Continuing difficulty is a problem a writing teacher may not expect to overcome, although teachers from other disciplines have. For example, a technical writing teacher may have difficulty evaluating a report from an unfamiliar subject area such as science or engineering, whereas teachers from those disciplines are better able to evaluate the content of such papers. To tell students to write for the writing teacher is poor teaching, but telling them to produce work that the teacher is likely to misjudge or mishandle is also unwise. This kind of situation lends itself to team evaluation of highly technical papers. The third kind of difficulty is inherent, and is one that no one can overcome. It is the temporary nature of the quality of technical writing and the constantly changing body of technology it represents. (HTH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

David N. Dobrin
The Writing Program
Massachusetts Institute of Technology
Cambridge MA 02139

ED198550

What's Difficult About Teaching Technical Writing

The word, "difficult," refers to a way we engage in an activity. Doing something is difficult if we do it with effort and with some doubt as to the eventual outcome. Depending on the nature and degree of doubt, there are three kinds of difficulty. If we are having difficulty with something but expect from the nature of the task or the fact that others can do it that we will eventually learn to do it easily, we are having a transitory difficulty. This is the difficulty of riding a bicycle, the difficulty of getting up in front of a group, the difficulty of choosing between vanilla and Chocolate Ripple. Other difficulties we do not expect to overcome, though we think in principle that the task admits easy success and we can see that others have overcome the difficulties. These are continuing difficulties. I have difficulty writing, for instance, and I expect to continue to have difficulty, but I know others for whom it is not at all difficult. I think of this sort of difficulty as a failure to call on the right resources. For most of us, self-discipline falls into this category, or being honest on our tax forms. The last kind of difficulty inheres in the task itself, given our capacities. These, no one does easily: resolving paradoxes or thinking of two things at once, confronting death or remembering dreams. These are inherent difficulties.

The transitory difficulties a new teacher of technical writing faces are only too apparent. They include learning a new curriculum, discovering the needs of a new kind of student, making up assignments and grading them, learning the textbooks, gaining a feel for technical style--and, as Maxwell Smart would say, loving it. These are difficulties we have teaching any new subject;

CS206131

© David N. Dobrin 1980

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
David N. Dobrin
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

they are not in principle different from those we would encounter if suddenly asked to teach Nigerian paleoliths. Nor are they particularly difficult as these things go, for there is a profession of technical writing teaching, which we find we have inadvertently joined, and the experienced in that profession have deployed themselves primarily so as to ease these difficulites. An association, a little magazine, summer programs, textbooks, and innumerable how-to articles exist which will help any reasonably thorough person construct and teach a perfectly competent course which will indeed help students. The fundamental principles (figure out your audience, organize to your reader's needs, reveal your organization, keep the pace right, label graphics, etc.) and the assignments (technical description, final project) are well-known; and the knowledge is well-distributed. The principals and assignments are not, however, known to most engineering students, and even an hour's dose of them helps a lot. A longer regimen helps more. So overcoming the transitory difficulties is fairly painless and has some pleasant side effects. Since there is so much content, the classes are fairly easy to conduct. No long pauses. Not only the science and engineering students are not intimidating, they are grateful.

Having overcome the transitory difficulties, a teacher of technical writing is in possession of a large body of what I shall refer to as the conventions of technology--habits of formatting, common organizational strategies, stylistic rules, and so on. At the heart of the continuing difficulties with teaching technical writing is the difficulty of teaching the student to deploy these conventions for his or her peers in a technical group and the obverse difficulty of judging when he has done so correctly. Consider, for instance,

my difficulty with a recent assignment, a page of which is shown in Figure 1. I can make a few comments on it, because I know the conventions: add a comma, object desultorily to the computer typeface. But unless I can find the head and the tail, no really deep commentary is likely to come and no fair grade is likely to be given. Frankly, I couldn't, and let me assure you that this page was of a piece with the rest. It turns out that the whole piece is excellent. It was part of a project proposal in a chemical engineering lab, and at the grading session, the ChemE teacher came in with that bemused smile one gets when a good student has performed beyond her best. His praise was immediate, spontaneous, gratified, and interminable, the last being for the best, since I needed time to get over my embarrassment at not having appreciated the piece. The moral of the story is paradoxical. We should be teaching students to write so that we don't understand it.

The teacher of technical writing is teaching the student to perform for his or her peers in a particular technical community, a community of which the teacher is not himself a member. It is as if he were teaching Balinese dancing in Bali. The conventions specific to that community supersede those that the teacher purveys; the conditions operating on the conventions not superseded are by no means intelligible. The title of the ChemE paper was "Evaluation of pentane...." I corrected that automatically to "Evaluating pentane . . ." The ChemE teacher corrected it right back. For the student, performing the community's specific conventions is more difficult than performing those taught in class because the conventional practices of the group, whether the titles of ChemE proposals or the headings on Digital Equipment's computer documentation,

3.2.1 NRTL

The NRTL (nonrandom two-liquids) equation for the molar excess Gibbs energy of a binary mixture is a function of mole fractions x_1 and x_2 :

$$\frac{g^E}{RT} = x_1 x_2 \frac{\tau_{21} G_{21}}{x_1 + x_2 G_{21}} + \frac{\tau_{12} G_{12}}{x_2 + x_1 G_{12}} \qquad 3.6$$

where

$$G_{12} = \exp(-\alpha_{12}\tau_{12}) \qquad 3.7$$

$$G_{21} = \exp(-\alpha_{12}\tau_{21}) \qquad 3.8$$

$$\tau_{12} = (g_{12} - g_{22})/RT \qquad 3.9$$

$$\tau_{21} = (g_{21} - g_{11})/RT \qquad 3.10$$

with

$$g_{12} = g_{21}$$

Equation 3.6 contains two temperature-dependent parameters, $(g_{12} - g_{22})$ and $(g_{21} - g_{22})$, in addition to a nonrandomness parameter, α_{12}, which to a good approximation does not depend on temperature. For some systems it appears that these parameters are linear functions of temperature. From equation 3.6 the activity coefficients γ_1 and γ_2 are obtained by differentiation. The NRTL equation is readily generalized to multicomponent mixtures. When experimental phase-equilibrium data are available over a range of composition, the optimum parameters $(g_{21} - g_{11})$ and $(g_{12} - g_{22})$ can be determined by a least-squares fit.

Figure 1. A Page from a Chemical Engineering Proposal (with Corrections)

designate modes of experience. They delineate relationships, define flows of authority, present the aims of the group and limit autonomy within the group. In other words, the practice of the group penetrates linguistic performance. And the teacher can know nothing of this practice, not having experienced it.

So the difficulties of teaching and judging are in fact much deeper than an occasional bafflement. Like any situation in which authority is in question, both participants are in a double bind. For a student, to write for his actual audience risks the displeasure of the teacher (who won't understand); to write for the teacher requires a delicate guile I am not sure we should be encouraging. For a teacher, telling a student to write for him is bad teaching. But telling the student to put out work that the teacher is likely to misjudge or mishandle, the teacher risks his or her authority. He is giving the poor student an obvious way to escape the authority--write impenetrably--and assuring the good student that good work will not be recognized accurately and rewarded. Teaching this entails mutual aggression. There is no way out of this; the very act of submission by which one assimilates the conventional practices of a group is an act of aggression against those outside it.

From a different perspective, this difficulty is an administrative one, for it seems to admit an administrative solution. Either an expert reader can be provided, or the students can all be taken from the discipline, which the teacher has some chance of learning. Across the country, many mechanisms for providing expertise or training the teachers have been tried, ranging from teaching cooperatively inside the engineering school (ME 201 Communication) to admitting students selectively (EN 334 Communication for ME Students). Indeed, technical writing is probably taught in more different ways--inside more

different departments--than any other ostensibly humanistic course. Those teachers without the benefit of an established administrative tactic still try to make contact with other experts. At Miami, I independently found teachers to give students useful writing projects in their disciplines and help grade the results. Yet whatever the way, the simple provision of an expert, I found, is not enough. Not knowing the curriculum, the expert is unlikely to be hyper-critical, as long as he or she understands the piece and likes what's going on in it, and will thus be unable to distinguish accidental success and genuine competence. Nor will teaching to pre-selected groups, because ~~it~~ pre-selection does not change the difficulty. It only reduces the number of conventions; it does not teach the teacher the conditions of their performance. And administrative tactics are themselves costly, since from the point of view of academia, they are special maneuvers, occurring outside or beside regular administrative channels. In essence, overcoming the difficulty means developing a network of relationships between writing teachers and technical groups which the academic organization neither recognizes nor supports.

From the administrative perspective, one can see that this difficulty is one of estrangement. And with that word, one can add a third form of the difficulty to the administrative and the pedagogical: the scholarly. Teaching technical writing distances the teacher from his own scholarly community. My peers ask me how I can get any satisfaction from teaching technical writing when I began by writing on Dickens. It is a common question, but that doesn't make it easy to answer. The common assumption is that I don't, can't, and shouldn't. It is unlikely that MIT will give me much credit toward tenure for having written this "pedagogical" paper. The assumption is in many cases

correct. Look at how many people live for their literature course, if they can get one, or devote all their scholarly effort to incunabula, and thus lead a life of scholarly schizophrenia. Are there scholarly satisfactions to teaching technical writing? I will return to this.

The scholarly difficulty refers us back to the pedagogical. For most people, teaching the conventions is teaching a craft, where teaching literature or essay writing is initiating a student in the teacher's discipline. In the former, the teacher judges and encourages an exhibition of skill. In the latter, a richer relationship operates. In the latter (in any mature discipline) there is a canon (privileged objects of study and standard modes of investigation) and an underlying aim (finding truth in science, making esthetic judgments in criticism). Teaching a mature discipline asks the student to recapitulate the learning the teacher has done; research asks the teacher to imitate the learning the student is doing. The university is built on this symbiosis. Yet in technical writing there is no canon, only a collection of ad hoc solutions. There is no aim. (Clarity is not an aim, but an effect.) And the teacher cannot be an example to the student nor go through what the student goes through.

The simple way to cope with all these continuing difficulties is to structure the course so that they never come up. All the problem occurs when students have to write for real people in real groups who have real uses for what is written. Never let this occur, and forget the problem. Teach rhetorical modes; let minor assignments be "exercises"; let major assignments be directed towards a "management" audience or be a "hypothetical." (Library research papers are ideal.) The result will be a recommendation report on which no

action will be taken, a scientific paper with no publisher. The student will have learned what the course taught, and the teacher will have time for other pursuits.

For the difficulty to be overcome, the students would have to be learning how to apply conventions to real situations. As yet, the profession doesn't know how to teach that. Our efforts, as I have noted, have been toward overcoming exclusion in another way, by including others in the same boat. But there is no reason in principle why we cannot develop a body of knowledge about how technological practice governs the deployment of conventions. Instead of teaching only a standard form for, say, progress reports or even teaching that progress reports have a common rhetorical shape, treat them as a response to a system of control, and learn how that control operates. Discover document pathways; observe the extent to which progress is formally integrated with goals; find how corporate style dictates selection of detail: become sensitive to the nuances of gesture toward upper management; detect small variations in genre. In short, return to criticism. Moving entirely away from academia and penetrating technical groups[1] may turn out to be not a further estrangement, but a fusing of the split we've all felt.

The last kind of difficulty is the inherent. I suspect that as we overcome the continuing difficulties, one such will surface. It would have to do with the temporary quality of technical writing and the technology it projects, the fact that the practice of technical writing is as mutable as fashion and as predictable. The body of knowledge we would develop, therefore, is likely to be successive, not cumulative, and historical, not scientific. The knowledge would always be somewhat behind the times. Moreover, the practice will resist

such historical inquiry. Corporations, particularly, do not conceive of themselves historically, nor do they suffer willingly the intrusion such a conception would warrant. Even if we can investigate, our conclusions are likely to be local, and our substantiating details will be private. The whole will be difficult to disseminate.

Let me conclude with one final observation about the continuing difficulties: they are also a continuing delight. Teaching technical writing is a wonderful way to find out about science and technology. From my technical writing class, I have learned how to isolate and perfuse rat hearts so as to test prostacyclin synthesis. I have learned what a multiplexer chip which will integrate voice and data transmission might look like. Whatever my earlier complaints about inaccessibility, I have found that with a good science background and a will to apply myself, I can get at least the gist of some pretty interesting stuff. It's like having a subscription to every science magazine without the condescension. In the chemical engineering class, students are busy removing acids from river water or slurrying coal and limestone at 900° K. to make synthetic fuel. Bravo! I say from the sidelines. Go Team.

FOOTNOTES

[1] By technical groups, I mean any group in which the engineering or science student will practice, including academic science and corporations.